

# **Evaluation of the BBSRC Japan Partnering Award Scheme**

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This document presents the conclusions of a Review Panel of experts.

The views expressed are those of the members of the Panel.

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## **ABBREVIATIONS**

BBSRC:	Biotechnology and Biological Sciences Research Council
BCB:	Biochemistry and Cell Biology Committee
CASE:	Collaborative Awards in Science and Engineering
DIUS:	Department for Innovation, Universities and Skills
EU:	European Union
EPSRC:	Engineering and Physical Sciences Research Council
ERATO:	Exploratory Research for Advanced Technology
HFSP:	Human Frontier Science Programme
IRU:	International Relations Unit
ISIS:	International Scientific Interchange Scheme
JASRI:	Japan Synchrotron Radiation Research Institute
JHSF:	Japan Health Sciences Foundation
JPA:	Japan Partnering Award
JSPS:	Japan Society for the Promotion of Science
JST:	Japan Science and Technology Agency
NEDO:	New Energy and Industrial Technology Development Organization
NERC:	Natural Environment Research Council
PI:	Principal Investigator
SICP:	Strategic International Cooperative Programme
VAMAS:	Versailles Project on Advanced Materials and Standards

## EXECUTIVE SUMMARY

This document records the findings of the Review Panel set up to provide an expert evaluation of BBSRC's Japan Partnering Award (JPA) scheme. The evaluation was undertaken as part of BBSRC's on-going programme of research evaluations of its funding schemes, responsive mode portfolio and research initiatives.

The JPA scheme formally came into being in 2000, with the first awards starting in 2001. The key objectives of the scheme were to: set up partnership links between UK and Japanese life science laboratories; promote the exchange of scientists, particularly post-doctoral researchers starting their research careers; promote access to Japanese facilities; and access Japanese funding for UK bioscientists.

The Panel was asked to assess the effectiveness of the scheme in meeting its objectives and judge the contribution the scheme had made to BBSRC's broader international strategy. Specifically, the terms of reference were to:

- assess the effectiveness of the JPA scheme in fostering long-term partnerships between UK and Japanese researchers
- assess the effectiveness of the JPA scheme in promoting the exchange of scientists
- comment on the level to which the JPA scheme has enabled BBSRC researchers to access Japanese facilities
- comment on the level to which the JPA scheme has enabled BBSRC researchers to access Japanese sources of funding
- in the context of BBSRC research priorities and Japanese research strengths, assess the balance and coverage of the funded awards, identifying strengths and gaps
- comment upon the application and assessment procedures of the JPA scheme
- identify ways to build on successes and ways to address identified gaps and issues.

## Key Conclusions

- Since the scheme's inception, thirty three awards have been made with a total BBSRC contribution of £1.33 million. Overall, this has represented a good investment for BBSRC. JPA support stimulated the development of long-term and lasting partnerships that enabled UK researchers to add value to their research programmes. UK scientists benefited by participating in researcher exchanges and through accessing Japanese infrastructure. However, award holders placed too much emphasis on networking activities and the scheme could have had a greater impact if there had been more focus on developing mutually beneficial collaborative research.
- The most successful achievements of the scheme derived from exchanges where research was conducted in partner laboratories. Participation of post-doctoral scientists and PhD students in these exchanges was good. Researcher exchanges produced wide ranging benefits, including joint publications, training and skills development, as well as access to and transfer of expertise.
- The scheme successfully enabled UK scientists to access Japanese infrastructure, resources and information. This was particularly true for structural biologists, who had used a variety of unique or distinctive Japanese facilities to develop their research programmes. Award holders also made effective use of a range of other Japanese materials, data, databases and techniques.

- Some of the activities funded through the JPA scheme did not represent a satisfactory investment of BBSRC resources. In particular, the impact of networking activities, workshops and attending scientific meetings was limited compared to the other activities the scheme supported.
- The scheme only achieved limited success in promoting access to Japanese sources of funding for UK scientists. Accessing Japanese funding was an ambitious goal and it was unrealistic to expect many award holders to obtain such support. There were a few notable exceptions where award holders had obtained substantial funding from Japanese sources, but it was unclear whether these could be directly attributed to the JPA scheme.
- The coverage of the science in the JPA scheme was good. Funded awards were aligned to BBSRC priorities and Japanese research strengths.
- The scheme's administration and application processes were good. The flexibility of the scheme was recognised as a key strength.

## Recommendations

- The Panel felt that the JPA scheme had been successful but that it had 'run its course' in its present form. The scheme's objectives were no longer as relevant as they had been at its inception: it is now easier for UK and Japanese researchers to establish collaborative links and the need to access Japanese infrastructure has decreased. This was underlined by the declining numbers of applications to the scheme.
- The JPA scheme should be updated to meet the current challenges facing UK and Japanese researchers wishing to develop partnership links. A refreshed scheme should focus primarily on supporting collaborative research. In particular, the scheme should place an emphasis on post-doctoral researchers and PhD students conducting experiments in partner laboratories. Aligning the scheme to the strengths of the Japanese research community will provide the best value to BBSRC. Whilst there should be scope within the scheme to support networking activities and access to Japanese infrastructure, these should no longer be a major focus of the scheme.
- For the 2008 call, the JPA scheme has been aligned with the Japan Science and Technology Agency partnering award scheme. This call will focus on the area of systems biology. The Panel endorsed this change and welcomed greater cooperation with Japanese agencies. For the future development of the scheme it will be important to monitor the emerging areas of Japanese science and identify where it will be beneficial for UK researchers to be involved in collaborative research.
- BBSRC should encourage increased involvement by junior, less well-established Principal Investigators as this would increase the scheme's impact. The scheme has primarily supported senior researchers and it is likely they could have supported their collaborations, albeit to a lesser extent, through other means.
- BBSRC should ensure that the assessment process is made explicit to applicants. The internal application review procedure used by the scheme was appropriate but was not widely understood by the research community.
- There is a need to ensure all award holders returned final reports informing BBSRC of the outcome of their JPA. A final award payment should be withheld until the final report is received.

## CHAPTER 1. BACKGROUND

### Introduction

1. The Biotechnology and Biological Sciences Research Council (BBSRC) is one of seven Research Councils sponsored through the Department for Innovation, Universities and Skills (DIUS) of the UK government. Its principal aim is to foster a world-class biological science community in the UK. The mission of the BBSRC is to fund internationally competitive research, to provide training in the biosciences, to encourage opportunities for knowledge transfer and economic impact, and to engage the public and other stakeholders in dialogue on issues of scientific interest.
2. BBSRC supports research in a number of ways, including research grants, studentships, fellowships and strategic grants to institutes.

### BBSRC's international strategy

3. BBSRC's international strategy<sup>1</sup> aims to ensure that the UK remains a world-leader in the biosciences, and that academic research, industrial R&D, and the UK economy benefit from the increasing scientific activity across the globe. The strategy focuses on four key areas of inter-related activity: promoting the movement of people, enabling international research and collaboration; ensuring access to world-class infrastructure and information; and discharging our global responsibilities.
4. The International Relations Unit (IRU) co-ordinates and leads on delivering BBSRC's international strategy. This includes managing the funding schemes that enable UK researchers to add an international dimension to their research programme.

### Evaluation context

5. Evaluation is of growing importance to BBSRC and, with its emphasis on evidence based decision making, to the UK government.

Evaluation plays a central role in:

- justifying BBSRC funding allocation and contributing to the evidence that all Councils are required to submit to DIUS
- informing internal funding decisions, providing evidence of progress and achievement, and facilitating the development of a strategic overview for future funding decisions
- enabling BBSRC to account to government, the public, the scientific community and other stakeholders for the funds it allocates
- helping BBSRC to improve its policy and practice, through informing policy decisions and the design of new schemes, programmes and processes; and through identifying good practice, lessons learned, and ways to improve processes.

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<sup>1</sup> [http://www.bbsrc.ac.uk/publications/corporate/international\\_strategy.pdf](http://www.bbsrc.ac.uk/publications/corporate/international_strategy.pdf)

6. Formal evaluation of research is currently conducted at a number of levels in BBSRC:
- |             |  |
|-------------|--|
| Project     | <ul style="list-style-type: none"> <li>• Evaluation of final reports from grants</li> </ul>  |
| Scheme      | <ul style="list-style-type: none"> <li>• Evaluation of Research Committee responsive mode portfolios</li> <li>• Evaluation of Research Initiatives (time-limited research funding in strategically significant areas), 2-3 years after the grants have ended</li> <li>• Evaluation of funding schemes (e.g. international Partnering Awards, New Investigator scheme)</li> </ul> |
| Institution | <ul style="list-style-type: none"> <li>• Institute Assessment Exercise, conducted every five years at the BBSRC-sponsored institutes</li> </ul>  |
7. BBSRC's Evaluation Strategy<sup>2</sup> outlines the Council's approach to evaluation and the methodology used. Along with reviews of the responsive mode portfolio and research initiatives, schemes such as the Japan Partnering Awards form an important part of BBSRC's evaluation programme.
8. This evaluation covers awards made through the Japan Partnering Award (JPA) scheme since the scheme's inception in 2000. The objectives were to
- assess the effectiveness of the JPA scheme in fostering long-term partnerships between UK and Japanese researchers
  - assess the effectiveness of the JPA scheme in promoting the exchange of scientists
  - comment on the level to which the JPA scheme has enabled BBSRC researchers to access Japanese facilities
  - comment on the level to which the JPA scheme has enabled BBSRC researchers to access Japanese sources of funding
  - in the context of BBSRC research priorities and Japanese research strengths, assess the balance and coverage of the funded awards, identifying strengths and gaps
  - comment upon the application and assessment procedures of the JPA scheme
  - identify ways to build on successes and ways to identify gaps and issues.
9. BBSRC's evaluations are evidence-based and conducted by an independent Review Panel comprising scientists who between them have expertise relevant to the JPA scheme remit. The Review Panel was asked to provide an independent scientific evaluation of the evidence presented (see Appendix 1 for Panel membership). The primary sources of information for the evaluation were questionnaire responses from applicants and award holders as well as award final reports. The details of the evidence presented to the review panel was:
- Questionnaires returned by 20 out of 25 lead Principal Investigators (PIs) who had received funding through the JPA scheme (representing 71% of all awards made through the JPA scheme)
  - Questionnaires returned by 24 out of 75 PIs who had made applications to the scheme that were not subsequently funded (a 32% response rate).
  - Collated data from 11 final reports from 14 completed awards
  - Additional information obtained from BBSRC databases

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<sup>2</sup> [http://www.bbsrc.ac.uk/organisation/policies/reviews/funded\\_science/bbsrc\\_evaluation\\_strategy.pdf](http://www.bbsrc.ac.uk/organisation/policies/reviews/funded_science/bbsrc_evaluation_strategy.pdf)

10. The remainder of this paper reports the findings of the Review Panel, which are divided into four broad subject areas:
  - a) Fostering partnerships with Japan
  - b) Award outputs and outcomes
  - c) Application and administration processes
  - d) Conclusions and future directions of the JPA scheme
  
11. The variety of activities supported by the scheme and the breadth of the funded projects prevent simple metrics from providing a true reflection of the scheme's accomplishments. A clearer picture emerges from specific examples of the scheme's achievements throughout the report.

## CHAPTER 2: FOSTERING PARTNERSHIPS WITH JAPAN

12. There is a considerable impetus for UK bioscientists to develop partnership links with life scientists in Japan. Japan is a world-leader in many key areas of bioscience research and is regarded as a partner of choice for the UK. The Global Science and Innovation Forum led by DIUS has confirmed Japan as a priority country for UK international effort in research, due to the scale and quality of its research base, its strengths in innovation, and its leadership in influencing the international research agenda through G8 and other means<sup>3</sup>. Research Councils UK also identifies Japan as a priority country for researcher-researcher links in its international strategy<sup>4</sup>.
13. The main mechanism by which the BBSRC supports the development of links with Japan is through the Japan Partnering Award (JPA) scheme. A key objective of the JPA scheme is to foster long-term partnerships with Japan by establishing and developing partnership links between UK and Japanese life science laboratories. The scheme emphasises establishing new links over developing pre-existing partnerships and there is an expectation that partnerships will develop into lasting research collaborations. In addition, the scheme aims to promote access to Japanese sources of funding for UK scientists and award holders are encouraged to seek out additional funding that will add value to their award.

### Establishing partnerships with Japanese researchers

14. The majority of award holders chose to establish partnership links with Japanese scientists because they were the most suitable partner for their research interests. It was appropriate that the primary driver for establishing a partnership should be shared research interests and the opportunity to develop mutually beneficial collaborative research. BBSRC expects UK researchers to be aware of the best Japanese scientists working within their scientific field, and of the centres of excellence within the Japanese research community, based upon the published literature.
15. Establishing partnerships with Japanese researchers takes longer than in other countries, and requires an understanding of the finesse of personal interactions and other cultural differences. The initiation of formal collaborations is likely to be facilitated by pre-existing links between partners. Indeed, there was only limited evidence that the JPA scheme had been successful in establishing new links between UK and Japanese life science laboratories: the Japanese partners for the majority of award holders were existing contacts or collaborators. In retrospect, it may have been naïve to expect UK or Japanese scientists to partner with researchers who were previously unknown to them, and the emphasis on establishing new links over developing existing collaborations within the scheme's assessment criteria should be relaxed.
16. Despite the limited achievements in establishing new links between the UK and Japan, the JPA scheme had been successful in fostering nascent partnerships. Whilst the majority of award holders already knew their Japanese partner, only a very small proportion had previously received financial support to develop their collaboration. Completed award holders were unanimous in their view that their partnership had developed significantly as a result of JPA funding, stating that the JPA award had allowed their partnerships to flourish and develop in exciting directions.

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<sup>3</sup> <http://www.berr.gov.uk/files/file34726.pdf>

<sup>4</sup> <http://www.rcuk.ac.uk/cmsweb/downloads/rcuk/publications/international.pdf>

17. The primary focus of several awards was funding networking activities or workshops designed to help develop further partnership links. There is value in these types of activities, for example, they contribute to the development of personal relationships that are needed before a formal collaboration can be initiated, or they can help identify Japanese researchers with shared research interests who were previously unknown to the award holder. However, these 'top-down' activities were less effective at developing partnerships than 'bottom-up' activities driven by the desire to conduct collaborative research. In addition, other funding sources are available that are better vehicles to support networking activities than the JPA scheme. For example, BBSRC provides funding for one off exchanges (via the ISIS scheme) or for international workshops, and the Royal Society provides funding for UK scientists to initiate international collaborations. UK researchers should use these other sources of funding to develop their partnership links prior to making a Partnering Award application. The emphasis placed by award holders on networking was disappointing.

### **Development of partnerships as a result of the JPA award**

18. All completed award holders stated that their partnership had developed significantly as a result of participating in the JPA scheme, and this was evident from the range of outputs reported by award holders (see Chapter 3). The scheme has been successful in developing long-term partnerships and the evidence indicated that all the partnerships had continued after the award ended. Partnerships had continued through additional meetings, subsequent visits and exchanges, and joint funding applications.

*Researchers at the Institute of Food Research have maintained three active scientific collaborations with Japanese scientists in Yokohama, Chiba and Sendai since their award ended in 2006. These are supported through BBSRC responsive mode. All the continuing collaborations have produced joint publications and several Japanese professors have visited the Institute.*

*The collaborating UK and Japanese organisations participating in the JPA led by a researcher at the University of York have signed a formal Memorandum of Understanding. This underpins future research collaboration in the areas of advanced biomaterials and tissue engineering.*

19. It was pleasing that there were relatively few barriers preventing collaborations from continuing after the JPA had ended. The primary concern expressed by award holders was the difficulty in obtaining further funding to support the collaboration, and in particular funding that would support joint research activities. While BBSRC responsive mode grants can provide support for collaborative research, BBSRC only provides funding to the UK partner – the international partner must obtain their own support. Award holders also noted that obtaining travel funds through responsive mode grants can be challenging. However, given that all completed award holders continue to collaborate with their Japanese partners, these barriers are not insurmountable.
20. To help assess the achievements of the JPA scheme in fostering partnership links, it is important to consider whether and how the funded UK-Japanese partnerships would have developed without JPA support. It is likely that the majority of the partnerships would still have developed: most PIs stated that they would have sought to develop collaborative links even if their JPA application had not been funded. However, these partnerships are likely to have involved fewer partners, fewer researcher exchanges and progress would have been significantly slower.
21. To an extent, it is obvious that the support provided by the JPA scheme will enable funded partnerships to flourish. A key issue is whether the additional value JPA funding

brings to a partnership is the most effective use of limited IRU and BBSRC resources. It is probable that some aspects of the scheme, such as networking activities, workshops and attending scientific conferences did not represent a good investment by BBSRC. However, the development of partnerships through researcher exchanges supporting 'hands-on' collaborative research had added significant value to BBSRC grants (see Chapter 3, p.13).

### **Additional financial support during the award**

22. There is an expectation from BBSRC that JPA award holders will seek additional support that will add value to their award. However, success in meeting this objective was limited. About half of completed award holders had received additional financial or in-kind support during their collaboration. A total of £220,000 of additional funding from non-BBSRC sources was reported by all award holders, representing 19% added value to the original £1.14 million BBSRC investment<sup>5</sup>. Award holders indicated that £130,000 of this funding was dependent on them having received the JPA (11% added value).
23. For the majority of awards, the additional financial support received was relatively small compared to the initial BBSRC investment. The additional support included airfares and associated travel costs for Japanese partners, accommodation expenses in Japan, as well as assistance from Japanese host institutions to conduct experiments (e.g. synchrotron beamline time). However, there were a few notable examples where PIs had received significant funding from non-BBSRC sources.

*A researcher at the European Bioinformatics Institute received a grant of £90,000 from New Energy and Industrial Development Organization (NEDO) to support the development of a standard graphical notation for diagrams of computational models in biology.*

*A scientist at Imperial College London was awarded an 8.1 million ¥ (£36,000) Exploratory Research for Advanced Technology (ERATO) grant from the Japan Science and Technology Agency to conduct research in human receptor crystallography.*

*A JPA supported partnership led by a researcher at the University of York received £29,200 from the Biomaterials and Tissue Engineering Centre of Industrial Collaboration to support the collaboration on biomaterials and tissue engineering.*

24. It was pleasing that the Japanese partners had sought their own funding to support the collaboration: about half of the completed award holders reported that their Japanese partner had received their own funding. Japanese researchers had accessed a variety of funding sources, including industry, Japan Health Sciences Foundation (JHSF), Japan Society for the Promotion of Science (JSPS), Japan Science and Technology Agency (JST), New Energy and Industrial Development Organization (NEDO), and internal university or institute funding. The monetary value of this support varied significantly, although in a few cases the level was substantial.

*A UK-Japan partnership in bionanotechnology led by a researcher at the University of Oxford was supported on the Japanese side by five awards made by the JST Strategic International Cooperative Programme<sup>6</sup>. This programme assists Japanese researchers and provides funding for research meetings by project researchers, joint research activities, and international researcher exchanges. The total value of these awards was approximately £900,000 over three years.*

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<sup>5</sup> The £1.14 million figure excludes the 2008 awards which had not begun at the time of the evaluation

<sup>6</sup> <http://www.jst.go.jp/inter/english/project/country/uk.html>

25. One objective of the JPA scheme is to promote access to Japanese funding for UK scientists. Although the limited number of researchers who gained access to Japanese funding was disappointing, this was not unexpected. It was probably unrealistic to expect significant access to Japanese funding, as this is very difficult to obtain - just as it is very challenging for foreign research groups to obtain support from UK funding agencies. However, more effort could have been made by award holders in this area. The evidence suggested that only half of award holders had sought to access Japanese funding or to encourage their Japanese partners to apply for funding to support the partnership. It is likely that many UK researchers were unaware of funding opportunities that were available to them or their Japanese partners. In addition, the small value of the JPA relative to a research grant may not have provided a strong incentive to seek out additional funding.

## CHAPTER 3: AWARD OUTPUTS AND ACHIEVEMENTS

26. In addition to fostering partnership links between UK and Japanese life science laboratories, the JPA scheme supports more specific activities which have more easily defined outputs and outcomes. These activities include the exchange of research scientists as well as enabling access to Japanese facilities, materials and expertise. Award holders are expected to engage in collaborative research, resulting in joint publications between UK and Japanese research groups. Partnerships should also develop over the course of the award, to the extent that they become sustainable without JPA support, and joint funding applications are an expected outcome of the award.

### Exchange of research scientists

27. A major objective of the JPA scheme is to promote the exchange of scientists, particularly post-doctoral researchers starting their research careers. This objective directly contributes to a key component of BBSRC's international strategy: promoting the movement of people. The JPA scheme had been successful in promoting the exchange of scientists and the awards had supported a significant number of exchanges at the post-doctoral researcher and PhD student level.
28. The most useful exchanges were those where researchers had conducted experiments at the partner institutions. 82% of completed award holders reported that their staff had conducted research in a Japanese laboratory as part of the JPA, and 45% of completed awards involved an exchange of a UK researcher to Japan for one month or more. Typically, it was the longer-term exchanges that had the greatest impact. Researcher exchanges provided benefits to the UK and Japanese research programmes, but participants also benefited from skills development, contributing to joint publications, as well as the experience of working in another country. Short term exchanges with the sole purpose of attending meetings or participation in networking activities were less valuable. Although the Panel recognised the importance for early-career researchers to have the opportunity to develop networking skills and establish academic contacts as part of their broader training, this did not represent the best use of limited JPA scheme resources. In particular, other funding sources are available for post-doctoral researchers and PhD students to attend scientific meetings.
29. The number of post-doctoral researchers and PhD students who had participated in the scheme was encouraging. However, it was difficult to determine the exact impact these exchanges had on award holders' research programmes or the overall development of international partnerships. From the information provided in final reports and questionnaire responses, there was only limited correlation between the early-career researchers who participated in the exchanges and the authors reported on joint publications. Nevertheless, there were a number of examples within the portfolio where post-doctoral and student exchanges had given rise to significant benefits to the research programme or the development of the partnership.

*As part of a JPA at Imperial College London, a post-doctoral researcher spent six weeks at the Tokyo Institute of Technology conducting single molecule observations of the F-subunits of Thermus thermophilus V-ATPase. The results from this work formed part of a joint research article published in the high impact 'EMBO Journal'.*

*A post-doctoral researcher from the University of York undertook a three month exchange visit to the National Institute for Materials Science (NIMS). The work carried out formed the basis of further discussions to establish a three way collaboration between the University of York,*

*NIMS and the University of Tokyo to identify a biomaterial carrier system for transplanting epithelial cell sheets for corneal and bladder tissue engineering.*

*A BBSRC CASE student from the University of Exeter spent three weeks at the Tokyo University of Life Science and Pharmacy. They conducted experiments on a hyperthermophilic alcohol dehydrogenase enzyme by circular dichroism and other spectrophotometric techniques. The exchange allowed the student to use distinctive Japanese facilities: the circular dichroism equipment in the Tokyo laboratory had been modified to work at temperatures up to 100°C.*

30. The JPA scheme also provides scope for UK research groups to bring Japanese scientists to the UK to conduct collaborative research. It was pleasing that over 90% of completed award holders reported that a Japanese scientist(s) had spent time in a UK laboratory conducting experiments. The length of individual visits varied considerably, from a couple of weeks to twelve months. Award holders reported that these exchanges had provided significant benefits to their own research groups, including the training of UK staff and knowledge transfer from Japan to the UK.

*A JPA enabled a Japanese researcher from the Nara Institute of Science and Technology to spend four months at the University of Birmingham. They shared best practice on transcriptomic studies with the UK researchers, and other work helped to launch a major new programme on the Escherichia coli Rsd protein, which is involved in the regulation of gene expression in response to stress.*

*A JPA at the University of Exeter supported visits of several Japanese colleagues and their students to the University. Two Japanese graduate students from Tottori University collected marine algae from the beaches of Devon and prepared extracts to assay for novel biocatalysts that may have industrial uses.*

*A JPA at the Institute of Food Research supported a twelve month fellowship for a Japanese researcher from Chiba University to work at the Institute.*

### **Access to Japanese facilities, materials and expertise**

31. Ensuring that UK scientists have access to world-class infrastructure and information is a key aspect of BBSRC's international strategy. The JPA scheme has successfully contributed to this objective, particularly for awards where the primary focus was not networking. Award holders had used the scheme support to access Japanese facilities, materials and expertise.
32. The use of the scheme to gain access to Japanese facilities was a notable achievement. Award holders had made use of facilities that were unique or highly distinctive in Japan and this had enabled them to conduct exciting research that has contributed to the scientific knowledge base in the UK. In particular, access to the SPring 8 synchrotron<sup>7</sup>, has been very beneficial for structural biologists.

*Researchers at Cardiff University, Imperial College London and the University of Manchester, have accessed the SPring 8 synchrotron at the Japan Synchrotron Radiation Research Institute (JASRI) as part of their JPA-supported collaborations.*

*A JPA at the University of Sheffield supported a collaboration with Japanese scientists at RIKEN. This granted access to the NMR centre at Yokoyama, which has unique facilities for conducting Nuclear Magnetic Resonance experiments on proteins at high pressure.*

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<sup>7</sup> <http://www.spring8.or.jp/en/>

33. The objective of supporting access to Japanese infrastructure has become less important over the scheme's lifetime. Similar facilities have become available in the UK (e.g. the Diamond synchrotron), as well as in Europe and the USA, where the majority of BBSRC international collaborations are based<sup>8</sup>. Indeed, this exposes a general risk associated with all schemes designed to address a particular scientific need: science often develops at such a rapid pace that a funding scheme may begin to address a specific need just as it is going away. There is still a need to provide support for UK scientists to access unique or state-of-the-art Japanese facilities, but this is unlikely to be the primary driver for establishing UK-Japanese collaborations in the future. Nevertheless, it was clear that, at the time the awards were made, access to these specialised facilities was beneficial to the research groups involved and the UK science base as a whole.
34. Award holders had accessed other Japanese resources as part of their collaboration. These resources included a wide range of materials such as mutant and transgenic lines, tissue samples, antibodies and purified proteins. Awards also provided access to data or databases, training or new techniques, and Japanese expertise. It was encouraging that all completed award holders indicated that they still had access to these materials after the JPA ended.

*A JPA led by a researcher at the University of Brighton resulted in unparalleled access to the world's largest collection of Werner's syndrome materials and reagents. Werner's syndrome is the closest model available for accelerated human ageing, and increased understanding will enable impacts on the course of normal ageing. A 1% compression per annum has been calculated to save the Department of Health £6.3 billion per annum by 2030.*

*An important benefit of a JPA involving researchers at the University of Birmingham and Japanese researchers at Nara was the exchange of sets of Escherichia coli deletion mutants and transcriptomics data. The award permitted pooling of resources and coordination of activities.*

*A JPA enabled a researcher at the University of Leeds to learn about decellularisation techniques used in Japan. As part of the partnership, valuable insights were also gained into Japanese progress in translating mesenchymal stem cell research into the clinic.*

35. For some of the Japanese resources used by UK researchers however, there did not appear to be compelling reasons to travel to Japan to access them. Exchange of datasets could be done over the internet, and some materials could easily be sent through the post. However, it should be noted that accessing resources was only a small part of the activities supported by the award. Furthermore, it was likely that the sharing of materials, data and other intellectual property was facilitated by the personal interactions and partnership links that had been fostered through the scheme. The establishment of mutually beneficial collaborations may have also increased the likelihood of gaining access to Japanese resources by building trust and providing reassurance that UK and Japanese groups were not in direct competition.

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<sup>8</sup> Past evaluations of BBSRC Research Committee responsive mode portfolios indicate that over 75% of new or improved contacts with overseas academics are within Europe or the USA.

## Joint publications with Japanese researchers

36. Joint publications are a useful indicator of the achievements of the JPA scheme as they represent an output of productive research collaborations. 81% of completed award holders<sup>9</sup> reported that they had co-authored papers with their Japanese colleagues. In total, 52 publications were reported by completed and current award holders as a result of the JPA-supported collaboration of which 49 had Japanese co-authors or were published back-to-back with the Japanese partner. A significant number of these publications was published in high impact multi-disciplinary journals or prestigious journals within specific scientific fields.

*Researchers at the University of Edinburgh published a highly influential paper on the cloning of the Nanog gene, which encodes a pluripotency sustaining factor in mouse embryonic stem cells. This paper was published 'back-to-back' with a research article from their Japanese colleagues in Nara and Osaka in the prestigious high-impact journal 'Cell'.*

*Scientists at the University of Oxford co-authored a paper on "Direct observation in steps in rotation of the bacterial flagellar motor" with their Japanese partners in Nagoya University. This was published in the multi-disciplinary journal 'Nature.'*

*Researchers at University College London published a joint research article on zebrafish brain lateralization with their Japanese partners at RIKEN. This paper was published in the high-impact journal 'Current Biology'.*

*Researchers at the University of Birmingham co-authored a paper in the prestigious journal 'Proceedings of the National Academy of Sciences of the USA' together with their Japanese partners at Osaka. The article examined secretion effectors in the pathogenic bacteria strain Escherichia coli O157.*

37. While the quality of these papers was clear, there was insufficient information in final reports and questionnaire responses to assess the exact contribution the JPA had made to joint publications. It was not clear whether joint publications had resulted from experiments conducted during researcher exchanges or from the 'pooling' of experimental results that the partner groups obtained separately. The Panel felt that it would be very useful if award holders could provide brief comments on the contribution the JPA had made to co-authored publications within their final reports. In particular, it would be helpful to know which aspects of the research in any publication depended on the JPA scheme support.

## Products, processes, resources, tools, technologies and intellectual property

38. Other outputs were also reported by the award holders, including new products, processes, resources, tools and technologies. These outputs varied widely, but included methods and techniques, reagents, transgenic lines, mathematical models and software. The level of activity and achievement in this area was in line with that observed in BBSRC Research Committee responsive mode portfolio evaluations.

*An outcome of a JPA at the European Bioinformatics Institute was the development of software to use interactomes, pathways and models, and to interconvert them between different standard formats. This is an important development for systems biology research.*

39. Relatively little new intellectual property had arisen as a direct result of the JPA scheme. This is not surprising as it takes time to develop a research programme to the

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<sup>9</sup> For whom data were available.

point where, for example, patent applications can be made. About one quarter of award holders expected that new intellectual property would arise from their partnership in the future, despite the possible issues arising when partners from two different countries wish to establish intellectual property and exploitation rights. Award holders in fact commented that it had been possible to overcome any such issues that had arisen. The proportion of award holders who expect intellectual property to arise from their award was slightly higher than observed with BBSRC Research Committee responsive mode portfolio evaluations

*The scientific contacts promoted by a JPA at the University of Edinburgh have indirectly stimulated the development of a biotechnology company, Stem Cell Sciences KK, that will develop and exploit the intellectual property coming out of the Centre for Developmental Biology in Japan. This new company forged a formal alliance with Stem Cell Sciences Ltd in Edinburgh including arrangements for sharing and exchange of technology that mirror the academic relationships fostered through the JPA.*

*A JPA led by a researcher at the University of Birmingham will help to provide information relating to the optimum chemistry and architecture of synthetic bone graft material. An expected outcome of the award is the development of a new synthetic titanium bone-substitute graft material, together with ways of processing this material for maximum efficacy. Several aspects of the research are expected to generate new intellectual property.*

## **Subsequent funding applications**

40. All completed award holders reported that the partnership supported by the JPA had resulted in at least one funding application. Unsurprisingly, given the difficulty of obtaining funding for joint research activities, the vast majority of these applications were made to BBSRC. With the information provided, it was difficult to assess the extent to which the JPA scheme had directly contributed to these applications, or whether JPA support had increased the application quality and the likelihood of them being funded.
41. Despite the majority of funding for follow on work coming from BBSRC, a small number of researchers had obtained funding from other sources to continue the partnership, which was a notable achievement. These other funding sources included the Japan Science and Technology Agency (JST), Japan Society for the Promotion of Science (JSPS), the Japanese government, the Engineering and Physical Sciences Research Council (EPSRC) and the Versailles Project on Advanced Materials and Standards (VAMAS).

*A researcher at the University of Glasgow used the JPA as leverage to obtain a NEDO grant from Japan. This UK-Japan collaboration focused on understanding the structure and function of photosynthetic antenna complexes with a goal of eventually using that understanding to construct nanodevices such as novel solar cells. The NEDO award provided approximately £270,000 over three years, and also allowed colleagues from Germany and USA to participate in the joint research programme.*

*A scientist at the University of Exeter obtained further support from the JST Strategic International Cooperative Programme. This award was to study "Receptor protein conformation and its functional analysis in single state" in collaboration with NTT Basic Research Laboratories in Japan.*

*A researcher at the University of York obtained further funding from the Versailles Project on Advanced Materials and Standards (VAMAS). The objective of VAMAS is to support trade in high technology products, through international collaborative projects aimed at providing the technical basis for drafting codes of practice and specifications for advanced materials.*

42. The Japan Science and Technology Agency provides support for collaborations with the UK through its Strategic International Cooperative Programme (SICP)<sup>10</sup>. For the UK, this programme focuses on collaborations in the areas of bionanotechnology, structural genomics and proteomics. Of the 19 awards made through the SICP scheme to date, 11 (58%) have involved UK researchers who have received support through the JPA scheme. It is difficult to determine the extent to which the JPA award enabled these UK researchers to access this funding. Nevertheless, award holders noted in their responses that the JPA provided leverage that had enabled them to access these funds.
43. It was surprising that no award holders had sought funding from Human Frontier Science Program<sup>11</sup> (HFSP) program grants, as these would be an appropriate way to follow up collaborations initiated through the JPA scheme. This may be related to the requirement that HFSP program grants must bring together scientists from different disciplines (e.g. from chemistry, physics, computer science, engineering) to focus on problems in the life sciences, whereas the UK and Japanese partners in JPA supported collaborations tend to be biologists.

#### **Wider benefits of the JPA scheme**

44. Award holders noted that the JPA scheme had provided a number of wider benefits to their research groups and to the UK science base. The most common benefit was that the JPA had allowed research programmes to flourish and develop in exciting directions. Other impacts included, strengthening the standing of the research group in the field, publicising the importance of the field of research, connecting previously disjointed communities, development of sustainable networks of UK-Japanese contacts, increased awareness of Japanese research, knowledge transfer from Japan to the UK, new business opportunities with Japan, training, and cultural exchanges.

*A JPA awarded to a researcher at Imperial College London was important for establishing collaboration with RIKEN in Japan. The collaboration was an essential part of the researcher's ERATO award from the Japan Science and Technology Agency, which brought £2.5 million to establish the Membrane Protein Laboratory at Diamond (Diamond-MPL, Oxfordshire, UK). The UK-Japan collaboration initiated through the JPA also contributed towards the signing of a Memorandum of Understanding between Diamond and RIKEN for ring and beamline development.*

*A key benefit of the JPA led by a scientist at the Institute of Food Research was the closer working relationship between two BBSRC institutes (Institute of Food Research, John Innes Centre) and Yokohama RIKEN institute (a centre of plant functional genomics and metabolomics). The JPA ensured that the Yokohama RIKEN institute is now collaborating with UK institutes and not just German institutes, as was the case prior to the award.*

45. It was apparent from the questionnaire responses that Japanese researchers also benefited from the JPA scheme. The listed benefits were very similar to those the UK partners had received, including access to UK expertise, access to UK facilities, access to UK and EU markets, exchange of ideas, methods and techniques, international recognition, knowledge transfer, joint publications, networking and training. It is essential that the partnerships fostered through the scheme are rewarding to all partners to ensure that they result in lasting, long-term collaborations. Japanese researchers had not been asked directly for their views on the scheme, however, as

<sup>10</sup> <http://www.jst.go.jp/inter/english/project/country/uk.html>

<sup>11</sup> <http://www.hfsp.org/>. The UK subscription to HFSP is paid by BBSRC and the Medical Research Council.

the Japanese culture makes it unlikely that they would have provided any criticism of the scheme if asked.

## CHAPTER 4: APPLICATION AND ADMINISTRATION PROCESSES

### Applications to the JPA scheme

46. Since its inception, the JPA scheme has received 151 applications with an average of 19 applications per call. After an initial peak for the first call, the number of applications remained relatively constant over the early years of the scheme. However, the Panel was concerned that the number of applications in 2006 and 2008 was very low, suggesting that there is a declining demand for the scheme in its present form. It is important that sufficient numbers of applications are received as this provides additional assurance that the funded applications are of the highest quality.

### Coverage of scheme

47. The coverage of the science supported by the JPA scheme was appropriate. The funded awards were aligned to BBSRC priorities and Japanese research strengths, with a very appropriate emphasis on structural biology and nanotechnology. These are areas where the Japanese have world-leading technologies and infrastructure, but also where the UK is internationally competitive and can effectively realise the benefits of UK-Japanese partnerships. Other areas supported by the JPA scheme included neurobiology, plant functional genomics, stem cell engineering and systems biology. The funded projects reflect areas of high priority to BBSRC over the evaluation period.
48. The support for stem cell research within the JPA portfolio was welcome. Japan is an ideal partner for establishing collaborations in stem cell research, as the Japanese have substantial expertise in this area, as well as similar legal and ethical regulatory frameworks to the UK. It is important that research conducted through international collaborations conforms to the UK's strict legal and ethical standards, especially where it involves sensitive topics, such as stem cells. The Panel was pleased that BBSRC and IRU are well aware of these issues and their implications for other Partnering Award schemes.
49. Although the coverage of the scheme was good, and generally reflected the focus of BBSRC activities over the past decade, there was scope to broaden the range of supported projects. The funded awards primarily fell within the remits of the Biomolecular Sciences Committee or the Engineering and Biological Systems Committee. Applications for the scheme within the Biochemistry and Cell Biology (BCB) Committee remit area were underrepresented, which was surprising given Japanese research strengths in cell biology. The scheme's aim of accessing unique facilities may have dissuaded researchers supported by the BCB Committee from applying, as this may not be particularly relevant to cell biologists. Furthermore, the emphasis the scheme placed on establishing new partnership links may have dissuaded researchers who had already begun to develop collaborative research programmes.
50. Since the scheme's inception 84% of JPAs have been awarded to universities, 12% to BBSRC institutes and 3% to other institutions. The Panel felt that this was appropriate, noting that this was comparable with the proportion of applications received from each area, as well as BBSRC responsive mode expenditure by organisation.
51. There had been an emphasis on funding senior, well-established researchers within the JPA scheme. These were highly respected scientists with reputations for

conducting excellent scientific research. However, in the context of fostering partnerships between UK and Japanese life science laboratories, it is likely that the scheme would have had a greater impact if there had been an increased focus on supporting junior or early-career Principal Investigators (e.g. BBSRC New Investigators<sup>12</sup>). Less well-established research groups are unlikely to have significant discretionary funds to support travel and exchanges, whereas more senior researchers may be able to access other funding to develop their partnership links. A JPA represents only a small proportion of the total funding support of a large established group, whereas the award could be a significant impetus for scientists who are beginning to establish themselves in academia.

## **Application and administration procedures**

52. In general, the application and administration procedures of the JPA scheme were good. The majority of funded award holders and unfunded applicants rated the application procedures as good or very good, and their comments indicated that these procedures matched those of other funding agencies (e.g. speed of application process, timing and number of calls for the scheme).
53. The only significant issues raised by JPA scheme applicants concerned the clarity and transparency of the assessment process. Comments from funded award holders and unfunded applicants indicated that there was insufficient information provided on the assessment criteria, a lack of transparency on the mechanism for application assessment, and a lack of feedback regarding unsuccessful applications. There were also statements that it was difficult to define exactly what the scheme was seeking to achieve based on the assessment criteria and other information published on the BBSRC website. The broad nature of the scheme's objectives probably contributed to this view.
54. JPA applications are reviewed internally by BBSRC Office against the scheme's assessment criteria, and are not sent out for external peer-review. To qualify for JPA funding, researchers must already hold a current BBSRC research grant or work at a BBSRC sponsored institute. This requirement ensures that the science within a JPA proposal has already undergone a rigorous peer-review process. There was evidence that the research community did not understand the JPA assessment process, and that some applicants were under the impression that the applications were peer-reviewed. The Panel endorsed the internal assessment procedure, noting that the relatively small amount of funding provided by each award did not justify sending applications for external review. A peer-review process would not be an effective use of resources and would increase the burden on the research community as a whole. However, the current assessment process should be made explicit to applicants via the BBSRC website.
55. The Panel felt that complaints about the lack of feedback from unfunded applications were understandable, and noted it was important to provide feedback where possible. Negative comments regarding feedback were probably related to a misunderstanding regarding the assessment procedures, particularly where applicants thought the applications were sent out for external review. BBSRC does provide feedback on

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<sup>12</sup> The New Investigator scheme is aimed at university lecturers and researchers at BBSRC and NERC institutes, within three years of their first appointment. Its purpose is to assist those individuals to obtain their first research grant. Applications are judged against the same criteria as other responsive mode proposals, but research potential rather than track record is taken into account.

unfunded JPA scheme applications upon request, although as the assessment process takes the form of a 'light touch' review, only limited feedback can be supplied.

## **Final reporting**

56. Three completed award holders had not submitted a final report at the time of the evaluation (21% of completed awards). This is unacceptable. Submission of a final report is a requirement of the JPA scheme and researchers should provide BBSRC with information about the outcomes of their funding. The Panel recommended that, as with other BBSRC grants, a final award payment should be withheld until the final report is received.
57. There was considerable variation in the content and style of the JPA scheme final reports. The Panel reviewed the final report form and noted that it could be more explicit in the questions asked. There was scope for more informative reporting and the final report should enable BBSRC to determine the contribution individual awards had made to the JPA scheme's higher level objectives. The report should remain brief, but some narrative commenting on how JPA support had directly contributed to the reported outputs would be very beneficial. For example: Which piece of science could not have been achieved without the scheme's support? Which research would have taken longer to achieve? Which papers could not have been written? It would also be helpful if more complete details were provided on the participation of post-doctoral researchers and PhD students in exchanges.

## **Other**

58. In general, award holders cannot apply for a renewal of their JPA after its completion. However, Principal Investigators can receive further funding from the scheme if a subsequent application contains novel elements, and to date three award holders have received further funding for a second JPA (10% of all lead PIs). The Panel felt that there was little justification for any partnership to receive a second tranche of funding from the scheme. Longer-term support for partnerships should be obtained from other sources, with continued research collaboration incorporated into responsive mode grant proposals.
59. The majority of award holders had learned about the JPA scheme through the BBSRC website, although some researchers were informed about the awards through a BBSRC e-mail, a UK colleague or BBSRC staff. Although the Panel was concerned with the declining number of applications, they did not feel that this was associated with a lack of publicity for the JPA scheme. BBSRC should publicise its funding schemes as widely as possible, but responsibility to seek out the information on funding opportunities rests primarily with researchers. The redesigned BBSRC website has made accessing information on BBSRC and IRU funding opportunities considerably easier.
60. A key strength of the JPA scheme was its flexibility, which ensured that UK researchers were able to respond to opportunities as they arose. The flexibility of the JPA scheme was recognised by award holders and endorsed by the Panel.
61. BBSRC International Relations Unit staff were regarded as very helpful by applicants to the scheme, and both funded and unfunded applicants made very positive comments regarding their interactions with BBSRC. The Panel also recognised the efforts made

by IRU to ensure that accommodating the aims of researchers was a primary driver for IRU activities.

*“BBSRC IRU staff are a pleasure to deal with!”*

*“BBSRC staff were extremely helpful whenever any queries were raised.”*

*“BBSRC staff were very helpful and put us in touch with the British Embassy in Japan when our first JPA application was unsuccessful.”*

*JPA applicants and award holders*

## CHAPTER 5: KEY CONCLUSIONS AND FUTURE DIRECTIONS OF THE JAPAN PARTNERING AWARD SCHEME

### Key Conclusions

62. The key conclusions arising from the evidence presented were:

- BBSRC's encouragement and support for collaborations with life-science laboratories in Japan has been positive.
- There are financial and cultural barriers to establishing collaborations with Japan and it is appropriate that BBSRC provides support for researchers to develop links with Japan through the Partnering Award scheme.
- The broad scope and flexible nature of the scheme had enabled researchers to tailor the awards to suit their individual needs. However, it has also led to a lack of focus within the scheme as a whole.
- The strongest aspect of the scheme has been its support for facilitating 'hands-on' research collaborations between UK and Japanese scientists. Longer-term exchanges where researchers conducted significant experimental work in a partner laboratory were especially valuable. Future development of the scheme should build on the achievements in this area.
- The scheme successfully enabled UK scientists to access world-class Japanese infrastructure and this was particularly valuable for structural biologists. In more recent years, the impetus for this activity has declined as more facilities have become available within the UK.
- The justification for funding networking activities, workshops and attendance at scientific conferences was weak. Fostering partnerships through 'top-down' networking activities is rarely as effective as building 'bottom-up' partnership links driven by mutually beneficial collaborative research.
- In recent years there has been reduced demand for the JPA scheme. The drop in applications suggests that it has fulfilled its original objectives.
- Although Partnering Awards are not a vehicle for supporting single research projects, there is greater scope for UK researchers to use the JPA scheme to develop collaborative research programmes with Japan.
- In general, the outcomes of the BBSRC investment in the JPA scheme were mixed. There were a few exemplary awards within the portfolio that stimulated excellent scientific research, provided important benefits to the UK research base and made significant contributions to realising the goals of BBSRC's international strategy. However, the scheme also supported some activities that added relatively little value to the UK research base.
- The impressive achievements of the most successful awards ensure that the scheme has, overall, represented a good investment for BBSRC. In the future, it will be essential to build on the strengths of the scheme and ensure that the weaknesses are addressed.

## Future direction of the JPA scheme

63. Over the evaluation period the JPA scheme has been successful in meeting the majority of its objectives. However, these aims are not as relevant today as they were at the scheme's inception. The research landscape in the UK and Japan has changed, collaborative links between the UK and Japan are now easier to establish and the need to access Japanese infrastructure has decreased. In this regard, it is timely to review the future direction of the scheme.
64. The JPA scheme should be updated to have a renewed focus on supporting UK-Japan partnership links where there is a specific goal of developing genuine research collaborations. An emphasis should be placed on UK and Japanese post-doctoral researchers and PhD students conducting research within partner laboratories, as these researcher exchanges have provided the most significant impacts of the scheme to date. Research collaborations should be balanced and mutually beneficial, as this will ensure that they develop into sustainable long-term partnerships. Joint publications should be an expectation of the scheme and this should be made explicit to award holders. A narrower, more defined focus will benefit the JPA scheme primarily by ensuring high quality research in priority areas for Japan and the UK is supported.
65. A refreshed JPA scheme should move away from supporting networking activities and enabling access to Japanese infrastructure. There will still be a need for networking and accessing facilities within the scheme, but these activities should not be its primary focus or should be funded through other schemes.
66. To date the JPA scheme has primarily supported well established researchers. This has limited the overall impact of the scheme as it is likely that many of the supported groups would have been able to develop their partnerships without JPA funding. Whilst the excellence of individual proposals must remain the key criterion in application assessment, the impact of the scheme would be increased if there was greater involvement from junior, less well-established Principal Investigators. There are fewer opportunities for junior researchers to fund travel and exchanges from their own research groups' resources, and BBSRC should encourage greater participation by more junior researchers.
67. Future developments of the JPA scheme should focus on fostering scientific research collaborations where there are opportunities for UK scientists to take advantage of world-leading Japanese research. Aligning the scheme to Japanese research strengths that complement areas of scientific excellence within the UK will provide the best value for BBSRC. The Japanese scientific community is known for announcing long-term plans regarding its research priorities. It will be important for BBSRC to consider these priorities in any future development of the JPA scheme. There are currently a number of emerging areas where Japan is developing strong capacity and expertise, including glycomics, nanotechnology, proteomics, structural biology and systems biology. In some of these areas Japan is making investments with the goal of establishing worldwide leadership. It is important that UK scientists are able to take advantage of these developments through mutually beneficial research links with Japan.
68. The Japan Science and Technology Agency has created its own partnering award scheme. BBSRC has proposed that the 2008 call of the JPA scheme will be aligned with this JST scheme, with a focus on systems biology. BBSRC has made a large investment in systems biology, which is a priority for UK bioscience, and Japan has a high profile in this area. The Panel endorsed this change to the scheme, and noted that this would also provide an opportunity to encourage UK scientists to interact with the BBSRC-sponsored systems biology centres in the UK. There is also potential for the

JPA scheme to engage other Research Councils with an interest in this area (e.g. EPSRC).

69. Further development of the scheme will require monitoring of the emerging opportunities within Japan, ensuring that it remains aligned with scientific areas where there are clear benefits to supporting UK-Japan partnership links. It may be useful to consult with members of BBSRC Research Committees and Panels to identify how the UK community could best take advantage of opportunities for collaboration with Japan. Whilst it is essential that the JPA scheme remains open to all BBSRC-supported grant holders, there is merit in aligning the scheme to particular areas of science as well as targeting publicity to researchers working in areas where the scheme would like to attract applications.
70. In the longer term, it is important that research collaborations fostered through the JPA scheme become sustained through other funding mechanisms such as responsive mode funding. There are well recognised barriers to conducting joint research where individual partners must approach separate funding agencies for support. Double jeopardy, where the separate parts of a joint research programme must win approval from two independent funding agencies, is a significant concern and was noted by the 2007 inquiry by the House of Commons Science and Technology Committee into the international activities and policies of the Research Councils<sup>13</sup>. Other issues, such as matching the timing of calls and decisions are also important. In this regard, the Panel was pleased that BBSRC is in active discussions with colleagues at the Japan Science and Technology Agency, and is working to remove these barriers. BBSRC and JST have held discussions regarding peer-review of applications, and the Japanese have been involved in shadowing of BBSRC Research Committees to learn more about the UK peer-review process.
71. BBSRC should also note that many of the most useful Japanese resources are freely available to the scientific community worldwide. For example, the Kyoto Encyclopedia of Genes and Genomes (KEGG) database<sup>14</sup> is routinely accessed by international researchers, and a wide range of biological materials are available from the RIKEN BioResource Center<sup>15</sup>. These resources do not require specialist BBSRC funding to access. In addition, the richness of UK-Japan collaborations cannot be fully captured by the relatively small number of partnerships supported by the JPA scheme: data from BBSRC Research Committee responsive mode portfolio evaluations indicate that around 3% of the new or improved overseas academic contacts arising from research grants are with Japan.

### **Conclusions relevant to all Partnering Award schemes**

72. BBSRC supports Partnering Award schemes for Japan, China, India and the United States. The Panel welcomed the principle of the Partnering Award schemes, although felt that there was little justification for BBSRC to provide support for developing partnership links with the USA. The Panel also noted that there was a strong need to develop collaborative research with countries not included in the Partnering Award schemes, with South American nations being important examples. The benefits from establishing partnership links with developing countries will not be derived from access to infrastructure, but rather through participation in exciting research projects that

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<sup>13</sup> <http://www.publications.parliament.uk/pa/cm200607/cmselect/cmsctech/1044/1044.pdf>

<sup>14</sup> <http://www.genome.jp/kegg/>

<sup>15</sup> <http://www.brc.riken.jp/inf/en/index.shtml>

broaden the scope of UK science. In this respect, the Panel welcomed a proposed UK-Brazil link in the field of bioenergy.

73. BBSRC's International Relations Unit monitors applications to its International Scientific Interchange Scheme (ISIS) to determine the demand from the research community for international collaboration with individual countries. The Panel welcomed this process, noting that the ISIS scheme is a more rapid mechanism that can be used to address immediate needs of researchers. It is important that the remits of the Partnering Awards and ISIS remain distinct.
74. BBSRC should ensure that it only supports partnerships where the main driver is a genuine interest in collaborative research. There is a risk with all funding schemes that applicants apply simply because money is available from BBSRC. For Partnering Award schemes to be effective, BBSRC must ensure they are funding activities and supporting research collaborations that could not be realised, to the same extent, through other means.

